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## Transportation and Land Use (TLU) Sector GHG Reduction Opportunities

The following tables provide examples of actions to reduce GHG emissions in the transportation and land use sector. The list is neither exhaustive, nor are the categories necessarily distinct. The main goal is to provide a starting point for this process.

We have also included some examples of current activities in Arizona that fit under various categories. Again this is not meant as an exhaustive list. We also need to account for policy developments related to SIPs for ozone and regional haze.

**Key to Indicators:** We will develop indicative results, as defined below, for potential emission reductions and costs of the options. These will be rough estimates based on experience or studies in Arizona or elsewhere and are intended to start off the TWG discussion of the priorities for analysis. Actual Arizona-based estimates will be developed for options that stakeholders decide to pursue in more detail, and may differ significantly from the preliminary indicators.

### Indicative Potential Emission Reductions -

**High (H):** Potentially capable of saving at least 1 Million Metric Tons CO<sub>2</sub>e per year by 2020 (~1% of current AZ emissions)

**Medium (M):** Potentially capable of saving from 0.1 to 1 Million Metric Tons per year by 2020

**Low (L):** Unlikely to yield more than 0.1 Million Metric Tons CO<sub>2</sub>e per year by 2020

**Uncertain (U):** Too many unknowns to hazard a guess

### Indicative cost (\$/tCO<sub>2</sub>e)

**High (H):** \$50/tCO<sub>2</sub>e or above

**Medium (M):** \$5-50/tCO<sub>2</sub>e

**Low (L):** \$5/tCO<sub>2</sub>e or lower

**Negative (Neg):** option yields net benefits

*Several measures overlap in terms of the emissions they would reduce. They may target the same emissions sources, but using different implementation pathways. The estimates shown here will assume that measures would be implemented independently from, or instead, of other measures.*

**Indication of Priorities:**

- **High:** High priority items are deemed deserving of considerable further analysis.
- **Medium:** Medium priority items will be carried forward, with the extent of further consideration and analysis to be determined later.
- **Low:** Low priority items will be moved to a separate list as options to be potentially considered at a later time.

		Priority: High, Med, Low	Implement . Level & Lead	Potential Emission Reduction s	Indicative Cost (\$/tCO <sub>2</sub> removed	Other Information, Co-benefits, Feasibility Consideration, Examples of Current Activities (currently only includes the latter)
<b>1.</b>	<b>PASSENGER VEHICLE GHG EMISSION RATES</b>					
<b>1.1</b>	<b>Vehicle Technology</b>					
1.1.1	Tailpipe GHG Emission Standards					
1.1.2	ZEV/LEV-2 Implementation					
1.1.3	R&D on Low-GHG Vehicle Technology (e.g., fuel cell)					
1.1.4	Add-on Technologies (Low Friction Oil, Low-Rolling Resistance Tires)					
<b>1.2</b>	<b>Vehicle Operation</b>					
1.2.1	Enforce Speed Limits					
1.2.2	Vehicle Maintenance, Driver Training					
1.2.3	Transportation System Management					
<b>1.3</b>	<b>Incentives &amp; Disincentives</b>					
1.3.1	Procurement of Efficient Fleet Vehicles					
1.3.2	Feebates (state-specific or regional)					
1.3.3	CO <sub>2</sub> -based registration fees					
1.4	Tax Credits for Efficient Vehicles					
1.4.1	Vehicle Scrappage					
1.4.2	(Additional option, if/as suggested)					
1.4.3	(Additional option, if/as suggested)					

		Priority: High, Med, Low	Implement . Level & Lead	Potential Emission Reduction s	Indicative Cost (\$/tCO2 removed	Other Information, Co-benefits, Feasibility Consideration, Examples of Current Activities (currently only includes the latter)
<b>2.</b>	<b>LAND USE AND LOCATION EFFICIENCY</b>					
<b>2.1</b>	<b>General</b>					
2.1.1	Infill, Brownfield Re-development					Arizona Brownfields Cleanup Revolving Loan Fund, Prospective Purchaser Agreement
2.1.2	Transit-Oriented Development					
2.1.3	Smart Growth Planning, Modeling, Tools					Growing Smarter Act [1998], Growing Smarter Plus Act [2000], Growing Smarter Oversight Council
2.1.4	Targeted Open Space Protection					
<b>3.</b>	<b>INCREASING LOW-GHG TRAVEL OPTIONS</b>					
<b>3.1</b>	<b>Increase Transportation Funding for Efficient Modes</b>					
3.1.1	Make full use of CMAQ funds					AZ has 90% obligation rate.
3.1.2	Improve Transit Service (frequency, convenience, quality)					ADOT public transit grant funds are targeted at rural and special needs users.
3.1.3	Transit Marketing and Promotion					
3.1.4	Bike and Pedestrian Infrastructure					ADOT Bike and Pedestrian Program <a href="http://www.azbikeped.org/">www.azbikeped.org/</a>
3.1.5	Expand Transit Infrastructure (rail, bus, BRT)					Light rail project approved for Phoenix-Mesa-Tempe [\$1.3 billion / 20 miles]. Target date of 2008.
3.1.6	HOV lanes					
3.1.7	"Fix-it-First"					

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3.1.8	Transit Prioritization (signal prioritization, HOV lanes)					
3.1.9	Telecommute and Live-Near-Your-Work					See esp. Pima County's Voluntary No-Drive Day. AZ does some encouragement of telecommuting on bad air quality days.
3.1.10	Car sharing					
3.1.11	E-Commerce					
<b>3.2</b>	<b>Incentives &amp; Disincentives</b>					
3.2.1	Commuter Choice/Parking Cash Out					
3.2.2	VMT Tax					
3.2.3	Pay As You Drive Insurance					
3.2.4	Increased Fuel Tax (w/ targeted use of revenue towards travel alternatives)					
3.2.5	Location-Efficient Mortgages					
3.2.6	Congestion Pricing (or tolls) (w/ targeted use of revenue towards travel alternatives)					
3.2.7	Parking Pricing or Supply Restrictions					
3.2.8	Transit Repositioning					
3.2.9	Transit Pricing Incentives					
3.2.10	VMT/GHG Offset Requirements for Large Developments					
3.2.11	Benefits for Low GHG Vehicles (preferential parking, use of HOV lanes)					
<b>3.3</b>	<b>Fuel Measures</b>					
3.3.1	Low-GHG Fuel Standard (e.g., renewable)					
3.3.2	Low-GHG Fuel for State Fleets (e.g., CNG, biodiesel)					
3.3.3	Biofuel expansion (biodiesel, CNG, LPG, cellulosic ethanol)					Some CNG bus expansion in public transit, school districts, and at airports
3.3.4	Alternative Fuel Infrastructure Development (e.g. hydrogen)					

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<b>4.</b>	<b>FREIGHT</b>					
<b>4.1</b>	<b>Vehicle Technology</b>					
4.1.1	Vehicle Technology Improvements (e.g., aerodynamics)					
4.1.2	R&D on Low-GHG Vehicle Technology					
4.1.3	Low-sulfur diesel					
4.1.4	Black carbon control technologies (e.g., use of particulate traps, other complementary technologies)					
<b>4.2</b>	<b>Vehicle Operation</b>					
4.2.1	Freight Logistics Improvements/GIS					
4.2.2	Enforce Speed Limits					
4.2.3	Improve Traffic Flow					
4.2.4	Increased Size & Weight of Trucks					
4.2.5	Increase the Number of Rest Areas					
4.2.6	Pre-clearance at Scale Houses					
4.2.7	Truck Stop Electrification					
4.2.8	Enforce Anti-Idling					
<b>4.3</b>	<b>Increasing Low-GHG Travel Options</b>					
4.3.1	Intermodal Freight Initiatives					
4.3.2	Raise Commuter Rail Wires					
4.3.3	Feeder Barge Container Service					
4.3.4	Intermodal Freight Initiatives					
<b>4.4</b>	<b>Incentives &amp; Disincentives</b>					
4.4.1	Procurement of Efficient Fleet Vehicles (public, private or other)					
4.4.2	Incentives to Retire or Improve Older Less Efficient Vehicles					
4.4.3	Maintenance and Driver Training					
4.4.4	Increased Truck Tolls or Highway User Fees					

		Priority: High, Med, Low	Implement . Level & Lead	Potential Emission Reduction s	Indicative Cost (\$/tCO2 removed	Other Information, Co-benefits, Feasibility Consideration, Examples of Current Activities (currently only includes the latter)
4.5	<b>Intercity Travel: Aviation, High Speed Rail, Bus</b>					
4.5.1	High-speed Rail					
4.5.2	Integrated Aviation, Rail, Bus Networks					
4.5.3	Aircraft emissions					
4.5.4	Airport Ground Equipment					
4.6	<b>Off-Road Vehicles (construction equipment, out-board motors, ATVs, etc)</b>					
4.6.1	Incentives for Purchase of Efficient Vehicles/Equipment					
4.6.2	Improved Operations, Operator Training					
4.6.3	Maintenance Improvements					
4.6.4	Increased Use of Alternative Fuels or Low Sulfur Diesel					